

17. Barnes, J., and O'Gorman, N.: Anthropometrical features of delinquent boys. *Irish Med J* 71: 15 (1978).
18. Hein, K., et al.: Juvenile detention: another boundary issue for physicians. *Pediatrics* 66: 239 (1980).
19. Hein, K.: The institutionalized adolescent: the pediatrician's role as youth advocate. *Pediatr Clin North Am* 27: 173 (1980).
20. Committee on Youth, American Academy of Pediatrics: Health standards for juvenile court residential facilities. *Pediatrics* 52: 452 (1973).
21. Litt, I. F., and Cohen, M. I.: Prisons, adolescents and the right to quality medical care: the time is now. *Am J Public Health* 64: 894 (1974).
22. Eisner, V., and Sholtz, R.: National survey of health care in institutions for delinquents. *In Who cares for the adolescent? Report to the Society for Adolescent Medicine*, edited by R. Meyer, 1973.
23. Brecher, E., and Della Penna, R.: Health care in "correctional" institutions. U.S. Department of Justice. L.E.A.A. Publication No. 027-000-000349-4. U.S. Government Printing Office, Washington, D.C., 1975.
24. Schuckit, M. A., and Morrissey, E. R.: Propoxyphene and phencyclidine (P.C.P.) use in adolescents. *J Clin Psychiatry* 39: 7 (1978).
25. Carper, J.: Medical care of delinquent adolescent boys. *Pediatr Clin North Am* 21: 423 (1974).
26. Hein, K., Marks, A., and Cohen, M. I.: Asymptomatic gonorrhea: prevalence in a population of urban adolescents. *J Pediatr* 90: 634 (1977).
27. Scott, P. D.: Medical aspects of delinquency. *Br J Psychiatry* Spec 9: 281 (1975).
28. Karniski, W., et al.: A study of neurodevelopmental findings in early adolescent delinquents. *J Adolesc Health Care* 3: 151-159 (1982).
29. Meltzer, L. J., et al.: An analysis of the learning styles of adolescent delinquents. *J Learn Disabil.* In press.
30. Hammar, S. L.: Screening medical inventory in the approach to the patient. *Pediatr Clin North Am* 20: 779-788 (1973).
31. Davie, R., Butler, N., and Goldstein, H.: From birth to seven. Second report of the National Child Development Study. Longman Group, Ltd., London, 1972.
32. Levine, M. D.: The school function program: profile of a general pediatrics consultative service model. Study under grant No. 4293 from the Robert Wood Johnson Foundation. Princeton, N.J., 1979.
33. Pasamanick, B., and Lilienfeld, A. M.: Association of maternal and fetal factors with the development of mental deficiency. *JAMA* 159: 155 (1955).
34. Sameroff, A., and Chandler, M.: Reproductive risk and the continuum of caretaking casualty. *In Review of child development research*, edited by F. Horowitz. University of Chicago Press, Chicago, 1975, Vol. 4, pp. 187-244.
35. Department of Health and Human Services: Better health for our children: a national strategy. DHHS Publication No. 79-55071. U.S. Government Printing Office, Washington, D.C., 1981, vol. 3, p. 261.
36. Snyder, H. N.: Delinquency 1979: U.S. estimates of cases processed by courts for juvenile jurisdiction. National Center for Juvenile Justice, Pittsburgh, Pa. 1981.

Hospital Discharge Data Used as Feedback in Planning Research and Education for Primary Care

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SYNOPSIS

Are research and training programs in pediatrics, internal medicine, and obstetrics and gynecology (OB-GYN) comprehensive enough to give trainees proficiency in primary care? Controversy exists about which subject areas should be added to the training schema to make them more applicable in primary

care. One approach to this controversy is to use the most frequent of serious patient problems that are outside these disciplines as feedback into the process of selecting areas for more comprehensive training.

In this study, patients' serious problems were defined as those requiring hospitalization. Diagnoses from the National Hospital Discharge Survey were grouped into categories of morbidity by age and sex. The most frequent categories outside the three disciplines were identified. For pediatrics these problems were trauma, mental disorders, and unintended pregnancy; for internal medicine, trauma, mental and gynecologic disorders, and unintended pregnancy; for OB-GYN, trauma and mental, cardiovascular, pulmonary, gastrointestinal, and arthritic disorders.

Since primary care is largely ambulatory care, the next step in the resolution of the controversy would be to define the competency level needed for the prevention, early recognition, and early management of these disorders in the ambulatory care setting. Once defined, competency levels can be examined

among trainees in the three specialties, and areas where competency is found inadequate can be emphasized. Although hospitalization data are not the only logical criteria for choosing areas for emphasis,

these feedback data offer a method of integrating patients' most frequent severe problems into the selection process.

P RIMARY HEALTH CARE HAS BEEN DEFINED as accessible, comprehensive, coordinated, and continuing care by accountable providers of health services (1). Primary care is generally recognized as the first level of personal health services and, as such, it largely is given in the ambulatory setting.

A current controversy is whether specialty research and training programs in pediatrics, internal medicine, and obstetrics-gynecology (OB-GYN) are sufficiently comprehensive for trainees to become proficient in primary care. For example, it has been proposed that internal medicine programs should add extensive ambulatory care experience and more comprehensive training by exposing trainees to other specialties such as dermatology, psychiatry, neurology, orthopedics, gynecology, otorhinolaryngology, ophthalmology, and allergy (2,3). It has also been recommended that those in primary care OB-GYN programs should have additional exposure to internal medicine, psychiatry, urology, renal disease, hypertension, and general endocrinology and metabolism (4). Other specialty areas have also been suggested for programs in pediatric primary care. Since length of the training period is limited, these proposals renew the challenge of selecting the areas of experience that will lead to competency in primary care without compromising expertise in the specialty area.

A traditional approach in designing research and training programs is to (a) identify patients' problems deserving attention, (b) define a competency level judged to be required to handle these problems, (c) determine if the trainees have attained the required level of competency, and (d) add educational experiences in areas where the level of competency is found to be inadequate. The current controversy concerns areas of training outside the three specialties: pediatrics, OB-GYN, and internal medicine. Thus a beginning towards resolving this controversy would be to identify patients' problems outside these specialties.

The problems of patients that most frequently are the reasons for office visits (5-7) are one measure of morbidity used to identify some areas for research and training in primary care. A disadvantage of this measure, if used alone, is that it tends to emphasize minor illnesses, since they are more frequently

treated in the office setting. Major morbidity, for which additional training may be more critical, would be underestimated. The use of an index assessing the severity of the problems on office visits (5) somewhat lessens this criticism. Another disadvantage of using problems patients bring to a physician's office is that this measure neglects major morbidity occurring in persons who have never, or have not recently, consulted a physician. Major problems of these underserved persons also deserve to be considered for inclusion in primary care that is striving to be accessible, coordinated, and continuing as well as comprehensive.

The most frequent diagnoses of patients admitted to hospitals are an alternative measure of morbidity. This measure has the advantages of emphasizing the more serious problems and including the major illnesses of those who never, or infrequently, receive ambulatory care.

For primary care practitioners, the hospital management of morbidity has less applicability than the prevention, early recognition, and initial management before the condition requires hospitalization. Nevertheless, frequency of hospitalizations is a measure of morbidity or health outcome and, as such, can be used as feedback to identify patients' serious problems outside of specialty disciplines.

In this study we examined the most frequent causes of hospitalization for males and females of various ages. We have summarized the reasons for hospitalizations and interpreted them with respect to the disciplines of pediatrics, internal medicine, and OB-GYN. Areas of frequent and severe morbidity that are not part of these traditional disciplines were identified and offered as potential subjects for expanded training for primary care.

Methods

Since 1965, the National Center for Health Statistics (NCHS) has conducted the continuing National Hospital Discharge Survey (8) based on a national sample of non-Federal short-stay general and specialty hospitals. A detailed report on the design of the National Hospital Discharge Survey has been published (9). The data for this survey are obtained

from the face sheets of the medical records of inpatients discharged from these hospitals. Medical data collected includes information on the diagnoses of the patients discharged. In our study we used 1978 data which included approximately 219,000 medical records from 413 hospitals (10). These data were weighted to produce essentially unbiased estimates for all similar hospitals in the United States for that year.

Medical diagnoses were coded according to the "Eighth Revision International Classification of Diseases, Adapted for Use in the United States" (ICDA) (11) with some modifications used by the National Hospital Discharge Survey (12). A maximum of five diagnoses was coded for each medical record. In this study, only the patient's first-listed diagnosis in the 1978 survey was examined. Although ICDA codes are divided into 18 major classes, a more useful classification system employs 121 disease categories (13). In our study these 121 categories were grouped within similar preventive systems, specialty areas, and age and sex distributions. For example, all categories relating to pregnancy were combined because they had similar age and sex distributions and the preventive strategies (if chosen) would be similar. This grouping reduced the number of disease categories to 40.

Many specialty programs of pediatrics, OB-GYN, and internal medicine have already been broadened to include training in morbidity areas outside of these disciplines. For example, many pediatric programs may already include training in the recognition and management of mental disorders, which traditionally are of the discipline of psychiatry. In our study, the feedback comparison was between the morbidity and the traditionally recognized specialty area. We used the terms "hospital discharge," "hospitalization," and "hospital admission" interchangeably in this report.

Results

Excluding newborn infants, there were an estimated 35,616,000 discharges from short-stay hospitals in 1978. The 20 most frequent diagnostic categories observed for both sexes and all ages are shown in table 1. These categories accounted for 78.23 percent of all discharges.

This listing served as a measure of the most frequent severe illnesses and conditions affecting persons in the United States whether or not they received care before hospitalization. To use this information as feedback to programs in pediatrics,

internal medicine, and OB-GYN, the most frequent diagnoses were arranged by sex and age groups consistent with the populations served by these specialties.

Pediatric age group. Research and training programs in primary care pediatrics are concerned with the needs of all ambulatory (or preambulatory) persons ages 0 to 14 years. (The new specialty of adolescent medicine was not considered in this analysis.) The most frequent diagnoses that are listed on hospital discharges in this age range (excluding newborns) are shown in tables 2 and 3 for girls and boys respec-

Table 1. Percentage distribution by most frequent categories of 35,616,000 hospital discharges

Rank	Category and ICDA code	Percent	Cumulative percent
1	Complications of pregnancy, child-birth, and the puerperium (630-678)	11.95	11.95
2	Heart diseases and hypertension (390-429)	8.83	20.78
3	Trauma (800-845; 848-959; 996)	7.19	27.97
4	Diseases and disorders of female genital organs (180-184; 199.3-199.4; 218-221; 612-629)	5.71	33.68
5	Pneumonia and other respiratory diseases (480-486; 501-519)	4.86	38.54
6	Mental disorders (290-315)	4.86	43.40
7	Gastrointestinal symptoms, enteritis, colitis, appendicitis (009; 540-543; 561; 563; 564; 784-785)	3.30	46.70
8	Upper respiratory disorders (460-474; 490-491; 493)	3.25	49.95
9	Ulcers, gastritis, hiatal hernia (531-535; 551; 553)	2.63	52.58
10	Tonsil and ear disorders (380-389; 500)	2.56	55.14
11	Kidney and bladder diseases (580-591; 593-599)	2.49	57.63
12	Other diseases of circulatory system (441-458)	2.49	60.12
13	Back pain and intervertebral disc (725; 728; 846-847)	2.46	62.58
14	Oral cavity and other digestive system diseases (520-530; 536-537; 565-569)	2.40	64.98
15	Liver, biliary and pancreatic diseases (570-577)	2.40	67.38
16	Other diseases of nervous system (320-373; 375-379)	2.37	69.75
17	Diabetes mellitus and endocrinopathies (240-258)	2.17	71.92
18	Arthritis and fracture of femoral neck (710-718; 820)	2.13	74.05
19	Special examinations and complications of care (793; 997-999; Y00-Y14)	2.09	76.14
20	Other musculoskeletal diseases (720-724; 726-727; 729-738)	2.09	78.23

Table 2. Categories of most frequent hospital discharges for females, by age group

Rank	Category and ICDA code ¹	Percent	Cumulative percent
<i>Ages 0 to 14 years, estimated 1,541,600 discharges</i>			
1	Tonsil and ear disorders	17.36	17.36
2	Upper respiratory disorders	11.21	28.57
3	Trauma	9.90	38.47
4	Gastrointestinal symptoms, enteritis, colitis, appendicitis	9.53	48.00
5	Pneumonia and other respiratory diseases	8.23	56.23
6	Congenital anomalies and perinatal morbidity (740-759; 772-778)	5.39	61.62
7	Viral, infective, and parasitic diseases (000-008; 010-136)	4.96	66.58
<i>Ages 15 to 44 years, estimated 10,471,700 discharges</i>			
1	Complications of pregnancy, childbirth, and puerperium	40.35	40.35
2	Disorders of female genital organs	12.93	53.28
3	Mental disorders	4.59	57.87
4	Special examinations and complications of care	3.65	61.52
5	Trauma	3.53	65.05
6	Gastrointestinal symptoms, enteritis, colitis, appendicitis	2.89	67.94
7	Oral cavity and other digestive system diseases	2.16	70.10
<i>Ages 45 to 64 years, estimated 4,402,500 discharges</i>			
1	Disorders of female genital organs	11.69	11.69
2	Heart diseases and hypertension	9.97	21.66
3	Mental disorders	5.08	26.74
4	Liver, biliary, and pancreatic diseases	4.57	31.31
5	Pneumonia and other respiratory diseases	4.37	35.68
6	Trauma	4.12	39.80
7	Diseases and malignant neoplasms of the breast (174; 199.2; 610-611)	4.05	43.85
<i>Ages 65 years and older, estimated 4,833,100 discharges</i>			
1	Heart diseases and hypertension	18.78	18.78
2	Arteriosclerosis and cerebrovascular diseases (430-440)	6.26	25.04
3	Arthritis and fracture of femoral neck	5.81	30.85
4	Pneumonia and other respiratory diseases	5.62	36.47
5	Trauma	5.46	41.93
6	Malignant neoplasm of digestive system, diverticulosis, and bowel obstruction (150-159; 197.4-197.9; 560; 562)	4.42	46.35
7	Other diseases of circulatory system	3.74	50.09

¹ ICDA codes are not repeated from table 1.

tively. The traditional discipline of pediatrics is well known for its contributions to research and training for most of these disorders: respiratory, infectious, gastrointestinal, and congenital disorders. An exception is trauma, which was the cause of 10 percent of the hospitalizations of girls and 14 percent of the hospitalization of boys in the 0- to 14-year group. Trauma is traditionally a part of the disciplines of public health (prevention) and surgery (early recognition and management). Thus trauma is a cause of frequent, severe morbidity that is outside the traditional pediatric discipline.

When the hospitalizations for children age 14 years and younger were further divided into 5 age groupings (figs. 1-3), two other frequent problems were evident. For girls in the age group 10 to 14 (fig. 1), the fourth ranking cause of hospitalization was complications of pregnancy, abortion, and childbirth (with and without complications), and complications of the puerperium. This category accounted for 21,000, or 5.4 percent of admissions of the 10- to 14-year-olds and was equivalent to the frequency of upper respiratory disorders (5.2 percent) in this female age group. Research and education in teenage pregnancy (sex counseling, contraceptive methods) are usually considered part of the disciplines of public health and OB-GYN and thus are outside the traditional discipline of pediatrics.

For both boys and girls in the age group 10 to 14 years, mental disorders were a frequent cause of hospitalization (figs. 2 and 3). Training in the early recognition and management of mental disorders is traditionally within the discipline of psychiatry, and these illnesses are also outside traditional pediatrics.

Internal medicine age group. Research and education programs in internal medicine at the primary care level are concerned with the needs of all ambulatory persons aged 15 years and older. Traditional programs in internal medicine are well known for their contributions to research and education for most of the frequent disorders in this age group (tables 2 and 3, figs. 1-3): neoplasms and cardiovascular, respiratory, gastrointestinal, and arthritic disorders, including back pain. One exception (as with the pediatric age group) is trauma. Research and education in the prevention (public health) and early recognition and management of trauma (surgery) is not customarily in the traditional discipline of internal medicine, and yet trauma is the cause of frequent and severe morbidity.

For females 15 to 44 years, 55 percent of the causes of hospitalization were related to obstetrical

and gynecological disorders (table 2). These disorders included (a) those related to pregnancy, (b) disease and disorders of female genital organs (including benign and malignant neoplasms, cervicitis, and disorders of menstruation), and (c) special examinations and complications of care (of which 53.5 percent were for sterilization and pre- and post-natal care). Thus, these data show frequent diagnoses in the gynecology and birth control categories which are outside the traditional discipline of internal medicine.

For persons of both sexes, aged 15 to 64 years, mental disorders were a frequent cause of hospitalization (tables 2 and 3, figs. 2 and 3). These disorders are the province of psychiatry. Thus, mental disorders in the age group served by internists occur with high frequency and are outside the traditional sphere of this discipline.

OB-GYN sex and age group. Research and training programs for primary care practitioners of obstetrics and gynecology are concerned with the needs of all ambulatory females over 15 years. The most frequent diagnoses (hospitalization) in this group are shown in table 2 and figs. 1 and 2. Traditional programs in OB-GYN are well known for their contributions to research and education in many of these disorders. For example, as stated previously, 55 percent of the admissions of females aged 15 to 44 years were related to OB-GYN disorders. However, the frequency of hospitalization for these diagnoses dropped to 12 percent in ages 45 to 64 years and 4 percent in ages 65 years and older. Thus, many frequent and severe illnesses and conditions of females are not part of the traditional OB-GYN discipline. In addition to trauma (public health and surgery disciplines) and mental disorders (discipline of psychiatry), there were also frequent hospitalizations for cardiovascular, gastrointestinal, pulmonary, and arthritic disorders, which are within the scope of internal medicine. Thus several frequent and severe diagnoses are outside the traditional OB-GYN discipline.

Discussion

Designers of training programs that produce specialists are faced with the challenge of (a) providing the depth of training needed to give the trainees the expertise to handle major and difficult problems in that discipline and, at the same time, (b) providing the breadth of training in areas outside the specialty to give physicians competence in preventing, recog-

Table 3. Categories of most frequent hospital discharges for males, by age group

Rank	Category and ICDA code ¹	Percent	Cumulative percent
<i>Ages 0 to 14 years, estimated 1,946,300 discharges</i>			
1	Tonsil and ear disorders	14.84	14.84
2	Trauma	14.01	28.85
3	Upper respiratory disorders	12.26	41.11
4	Pneumonia and other respiratory diseases	8.81	49.92
5	Gastrointestinal symptoms, enteritis, colitis, appendicitis	8.68	58.60
6	Congenital anomalies and perinatal morbidity	6.13	64.73
7	Viral, infective, and parasitic diseases	4.36	69.09
<i>Ages 15 to 44 years, estimated 4,565,300 discharges</i>			
1	Trauma	21.30	21.30
2	Mental disorders	10.74	32.04
3	Back pain and intervertebral disc	5.78	37.82
4	Gastrointestinal symptoms, enteritis, colitis, appendicitis	4.74	42.56
5	Pneumonia and other respiratory diseases	4.35	46.91
6	Other musculoskeletal diseases	3.79	50.70
7	Heart diseases and hypertension	3.65	54.35
<i>Ages 45 to 64 years, estimated 3,980,900 discharges</i>			
1	Heart diseases and hypertension	18.34	18.34
2	Mental disorders	6.54	24.88
3	Trauma	5.88	30.76
4	Pneumonia and other respiratory diseases	5.38	36.14
5	Ulcers, gastritis, and hiatal hernia	4.07	40.21
6	Other diseases of circulatory system	3.89	44.10
7	Back pain and intervertebral disc	3.58	47.68
<i>Ages 65 years and older, estimated 3,875,100 discharges</i>			
1	Heart diseases and hypertension	19.66	19.66
2	Pneumonia and other respiratory diseases	9.00	28.66
3	Neoplasms and hyperplasia of prostate (185; 199.5; 600)	7.00	35.66
4	Arteriosclerosis and cerebrovascular diseases	5.78	41.44
5	Malignant neoplasms of digestive system, diverticulosis, and bowel obstruction	4.07	45.51
6	Other diseases of circulatory system	4.05	49.56
7	Kidney and bladder diseases	3.47	53.03

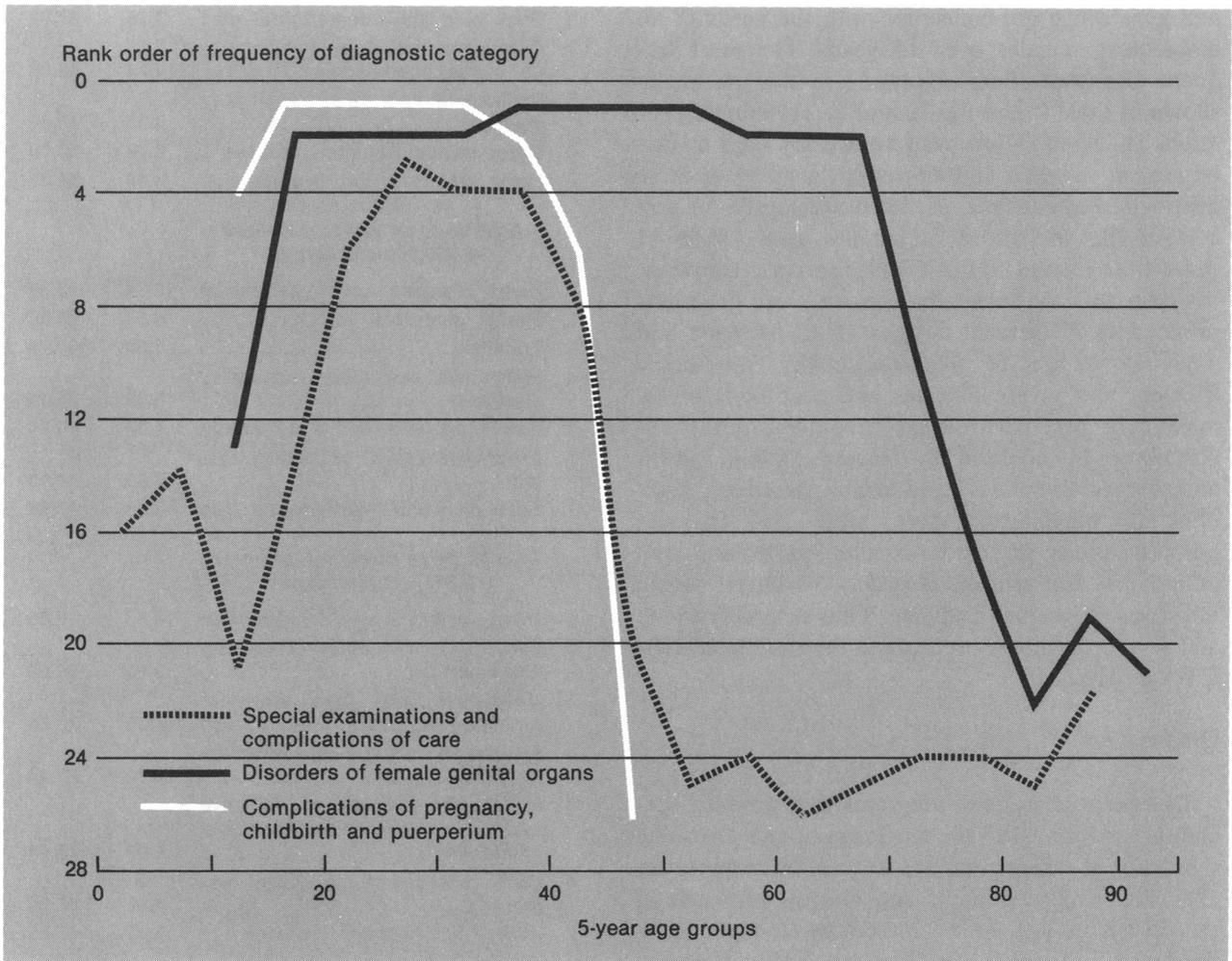
¹ ICDA codes are not repeated from table 1.

nizing, and managing many of their patients' other problems. Specialty programs have been and are meeting this challenge by providing indepth specialty training in hospital care and encouraging more ambulatory experience in a variety of conditions outside their specialties (14).

However, opinions vary greatly as to which areas and how many, outside these traditional disciplines, deserve to be emphasized in preparing physicians for primary care. Recent proposals to broaden research and training programs in primary care do not relate their proposed changes to specific morbidity needs. Rather, the proposals are related to generalities in meeting patients' needs in primary care, adapting programs to the changing role of the physician or to the new breed of primary care physician. This ap-

proach is in contrast to the traditional rationale of specialty programs, which has been to adopt changes in training when specific needs of the populations that they serve are identified. Over many years the populations served by these specialties have greatly shifted from those persons on one specialty service in the hospital to larger numbers of ambulatory persons. Thus using the most frequent, major diagnoses of persons served by the specialty as feedback would be consistent with the traditional rationale—that is, using a health outcome measure as feedback to evaluate training programs. For primary care practitioners, the training objective would be to gain skills in prevention, early recognition, and early management of these illnesses in the ambulatory care setting.

Figure 1. Frequent causes of hospitalization of females related to obstetrical and gynecological problems, by rank order of frequency of diagnostic categories within 5-year age groups



NOTE: The occurrence of pregnancy is a frequent cause of hospitalization within the ages (see 10-to 15-year group) served by pediatrics (15 years or

younger). All 3 problems are frequent causes of admission in the age groups served by internal medicine (over 15 years).

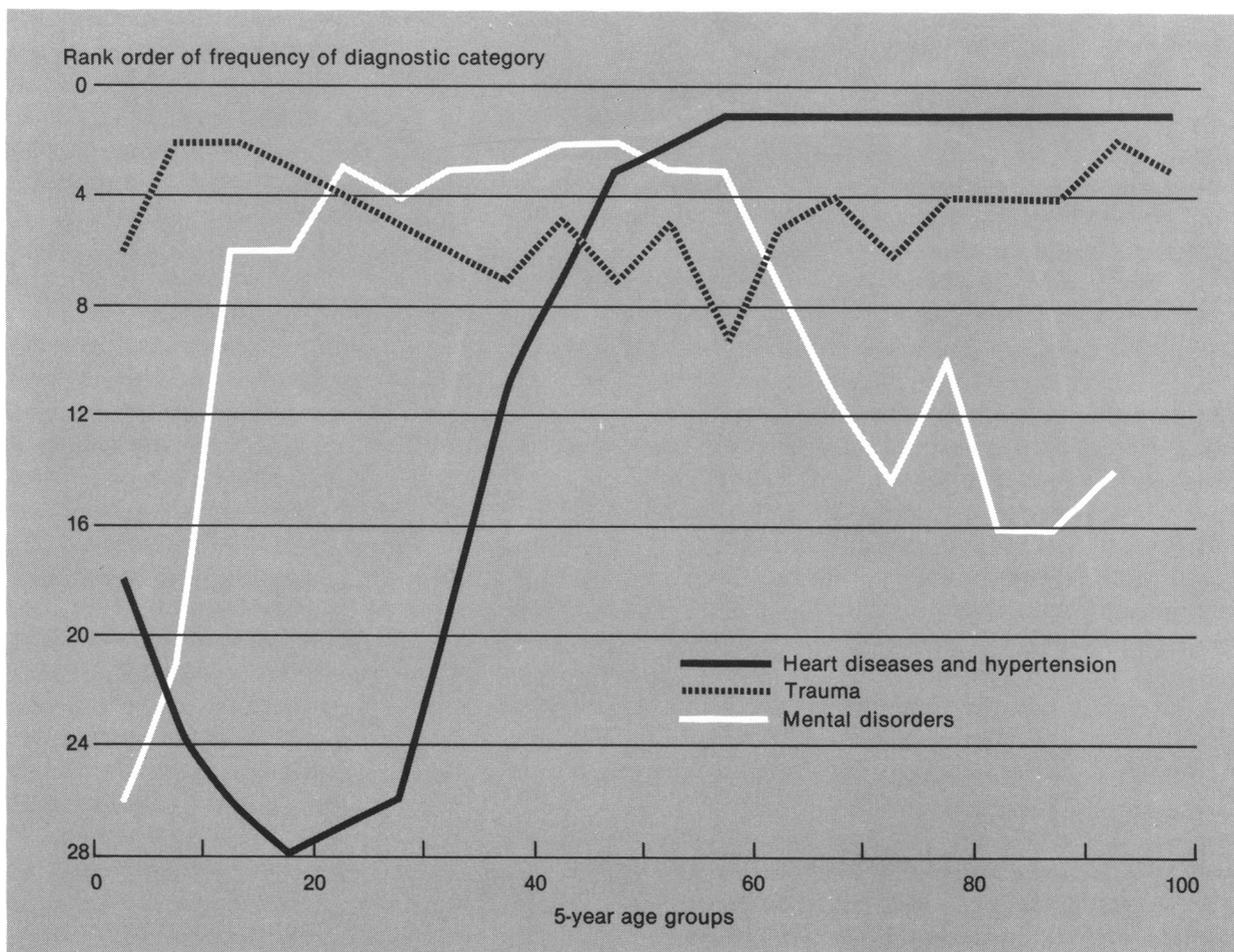
In this study, the most frequent major illnesses (those severe enough to require hospitalization) were grouped according to the sex and age of the populations served by specialists in pediatrics, internal medicine, and OB-GYN. These illnesses were then used as feedback for comparison with the traditional specialty areas. For many diagnoses, the specialty programs are leaders in research and education concerning the prevention, early recognition, and early management (primary care) of these disorders. However, certain conditions appeared to be outside the traditional disciplines. These conditions among the pediatric population were trauma, mental disorders, and teenage pregnancies; for the internal medicine population: trauma, mental disorders, gynecologic disorders, and pregnancy; and for the OB-

GYN population: trauma, mental disorders, and gastrointestinal, cardiovascular, respiratory, and arthritic conditions.

Some comparisons can be made between the most frequent causes of hospitalization and the most frequent complaints coded as serious that patients bring to physicians' offices (5). Diseases of the circulatory system, mental disorders, and diseases of the respiratory system are the reasons for many office visits (5) and were frequent causes of hospitalization (table 1). Thus, both sources of data are in agreement that these are areas of frequent, severe morbidity among the ambulatory population.

Problems viewed from the physicians' offices and those viewed from hospital admissions differ mostly in two categories of diagnoses. Accidents and injuries

Figure 2. Frequent causes of hospitalization of females not related to obstetrical and gynecological problems, by rank order of frequency within 5-year age groups



NOTE: Heart disease and hypertension is a frequent cause in the age groups served by OB-GYN and internal medicine (over 15 years). Mental disorders and trauma are frequent cause for admission in the ages served by all 3 specialties.

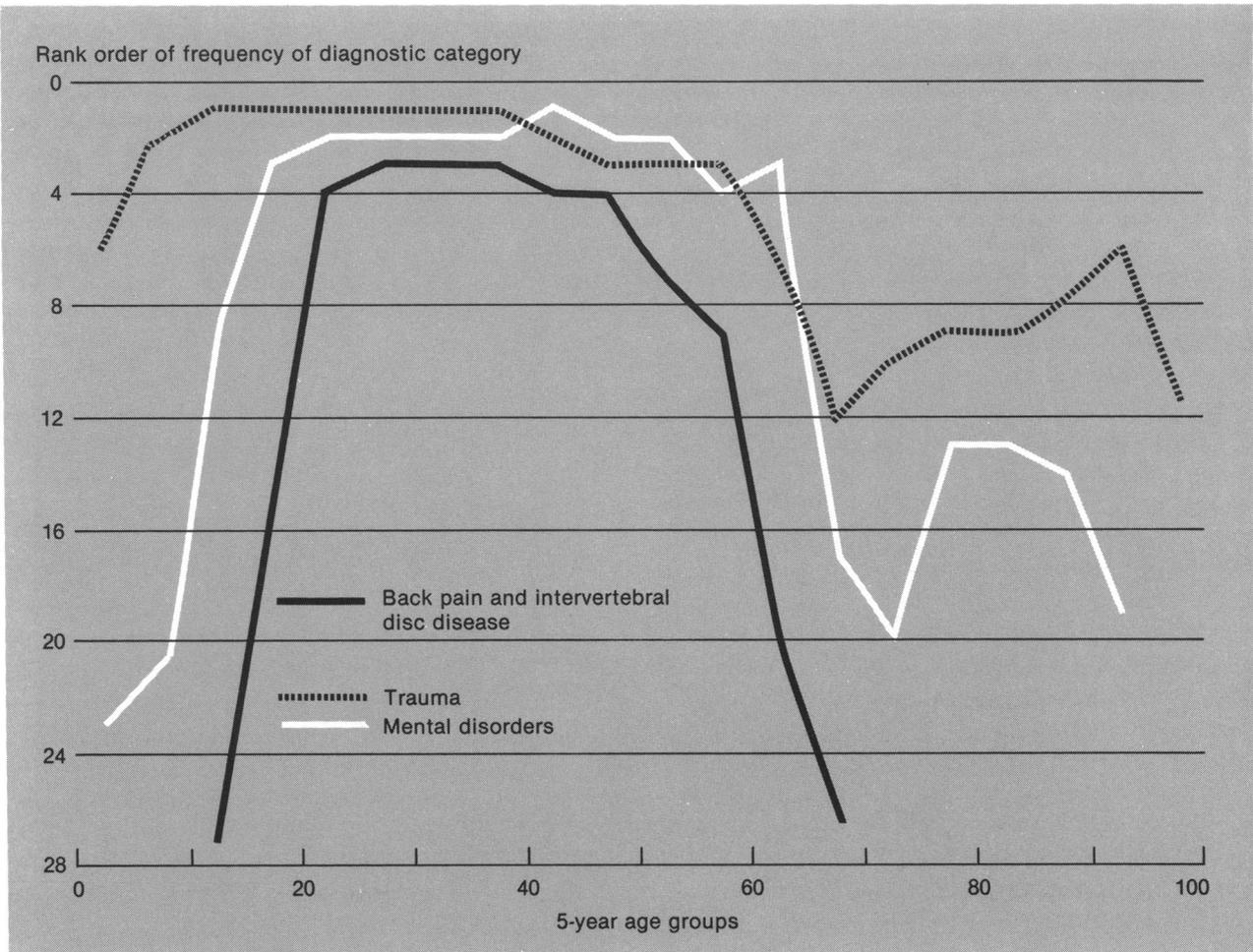
that prompt office visits (5) are less frequent and much less serious than those that result in hospital admissions. Thus, morbidity based upon office visits alone would markedly underestimate the frequency and severity of trauma morbidity.

Measures of morbidity associated with pregnancy as reflected in office visits (5) and hospital admissions (table 1), also differ greatly. The disagreement was in the severity or seriousness of morbidity. Visits for birth control and prenatal visits to the physician's office are classified under special conditions and examinations without sickness and 95 percent are coded as not serious or only slightly serious (5). Thus the morbidity of pregnancy, if confined to office visits, would underestimate the seriousness of this condition, which requires hospitalization not only for childbirth but also for complications of pregnancy and the puerperium. Other measures can be used to illustrate the seriousness of unintended pregnancies.

For example, in 1978 there were 1.37 million abortions performed. One-third of these abortions were obtained by teenagers, and 74 percent were obtained by unmarried women. Between 1971 and 1976, 34 percent of births resulted from unplanned pregnancies. Eleven percent were pregnancies that were unwanted prior to conception and 23 percent were pregnancies that the mothers felt occurred too early in their lives (15). These other measures further illustrate how morbidity based on office visits underestimates pregnancy as a serious problem for primary care practitioners.

Although the rationale of using hospitalizations as a measure of frequent and severe morbidity was very useful, one exception was identified. Diabetes mellitus did not appear with high frequency among the reasons for hospitalization (table 1) or for office visits (5). However, the presence of diabetes mellitus as a risk factor for cardiovascular, renal, and

Figure 3. Frequent causes of hospitalization of males, by rank order of frequency within 5-year age groups



NOTE: Trauma is the most frequent cause of admission in certain age groups served by pediatrics (see 10-to 15-year group) and internal medicine (see 15-to 40-year groups). Mental disorders and back problems are frequent causes of admis-

sion in the age group served by internal medicine (over 15 years). Heart disease and hypertension (not shown) are the most frequent causes in middle ages and older.

infectious diseases as well as for complications of pregnancy is well established and its addition as a frequent underlying patient problem can be easily justified.

Two more steps are needed before these identified areas of morbidity are proposed as additions to specialty programs in pediatrics, OB-GYN, and internal medicine. First, a level of competency or experience for primary care (prevention, early recognition, and management) has to be defined. The definitions (subjective and objective) will require interactions between specialties. For example, pediatricians with consultation from psychiatrists would define what level of competency or experience is needed for primary care of mental disorders in the pediatric population. This definition has already been accomplished in some programs. The second step is to determine if the trainees have attained that level of competency or experience by subjective and objective examinations. If the defined level has not been attained, then the specific morbidity would become an area of training or experience needed for primary care.

With the recognition that there is this intrinsic difference between the areas of morbidity and the areas where training is needed for primary care, it is still appropriate to make some comparisons between the areas identified in this study as potential training needs and additions to training programs proposed previously.

In 1969, Meyer (16) reported a survey of research and training in the prevention, early recognition, and early management of trauma among pediatric programs. He raised significant questions at that time as to the adequacy of training about trauma. A reexamination of programs at this time would be helpful. Adding the prevention and early management of trauma has not been proposed for internal medicine (2,3,17) or OB-GYN (4) programs. This may be because morbidity has been underestimated; however, there may be other reasons. OB-GYN programs frequently encourage rotation through other surgical subspecialties, and their trainees probably have adequate background in the early management of trauma for primary care. However, injury prevention may not be a part of these other surgical subspecialties. The current body of information on the prevention of accidents that cause traumatic injuries is not as well developed as are other techniques of prevention. Some methods of prevention such as use of smoke detectors, of car seat restraints, of helmets by motorcyclists, and the reduction of water heater temperature to prevent scald burns

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are recognized as effective. It is less well recognized that some interventions are effective in improving patient compliance with methods of trauma prevention (18-20). Clearly more research to find methods for improving compliance needs to be done, and primary care programs are likely sites.

Although Ebert (17) has recommended that skills in counseling on sexual and marital problems be added to the primary care programs in internal medicine programs, teaching patients about birth control is not part of other proposals for internal medicine (2,3), and the skills have not been emphasized in proposals for pediatric primary care. This omission may be due to the underestimation of morbidity when using office visits as a measure, or it may be an area developed so well in OB-GYN hospital programs that primary care pediatric and internal medicine programs are reluctant to broaden their curriculums in the presence of respected expertise. There is certainly an extensive body of information on effective means to prevent unwanted pregnancies (birth control). In addition, these methods of contraception have been effectively used with adolescents and have led to marked reductions in unwanted pregnancies (21,22). Thus, unintended pregnancy is a diagnosis for which the level of competency or experience needed for primary care pediatricians and internists remains to be defined.

Training in the early recognition and management of emotional and mental disorders has been proposed for, or has already been added to, many specialty programs for primary care. The data from our study would support continued focus on defining the levels of competence or experience needed for primary care. Several other areas have been proposed as necessary additions to primary care programs: dermatology, ophthalmology, neurology, otorhinolaryngology, and allergy (2,3). The justification for these

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additions is not clear from the proposals. Their rationale may be an attempt to reach the goal of handling, without referral, more than 90 percent of the health care problems of the population served (1). Adding all the areas previously proposed to specialty curriculums would either lengthen the training period significantly or compromise the indepth expertise in that specialty (2,17). Both options would require radical changes in programs. Lengthening postgraduate training may be justified since length of training is strongly related to indices of high quality in physician performance (23). However, resources for lengthening the training period are limited, and feedback concerning the most frequent areas of severe morbidity can offer direction for setting priorities.

References

1. Division of Health Manpower and Resources Development, Institute of Medicine: A manpower policy for primary health care: report of a study. IOM Publication No. 78-02. National Academy of Sciences, Washington, D.C., 1978.
2. Petersdorf, R. G.: Internal medicine and family practice. Controversies, conflict, and compromise. *N Engl J Med* 293: 326-332, Aug. 14, 1975.
3. Goroll, A. H., et al.: Residency training in primary care internal medicine. Report of an operational program. *Ann Intern Med* 83: 872-877 (1975).
4. Willson, J. R., and Burkons, D. M.: Obstetrician-gynecologists are primary physicians to women. II. Education for a new role. *Am J Obstet Gynecol* 126: 744-754 (1976).
5. Ezzati, T., and McLemore, T.: The National Ambulatory Medical Care Survey: 1977 summary. PHS Publication No. 80-1795. Vital Health Stat [13], No. 44, U.S. Government Printing Office, Washington, D.C., 1980.
6. Burnum, J. F.: What one internist does in his practice. Implications for the internists' disputed role and education. *Ann Intern Med* 78: 437-444 (1973).
7. Wood, M., Mayo, F., and Marshand, D.: A systems approach to patient care, curriculum, and research in family practice. *J Med Educ* 50: 1106-1112 (1975).
8. Sirken, M. G.: Utilization of short-stay hospitals: annual summary of nonmedical statistics, United States, 1965. PHS Publication No. 1000. Vital Health Stat [13], No. 2, U.S. Government Printing Office, Washington, D.C., 1967.
9. Simmons, W. R.: Development of the design of the NCHS Hospital Discharge Survey. PHS Publication No. 1000. Vital Health Stat [2], No. 39, U.S. Government Printing Office, Washington, D.C., 1970.
10. Haupt, B. J.: Utilization of short-stay hospitals: annual summary of the United States, 1978. PHS Publication No. 80-1797. Vital Health Stat [13], No. 46, U.S. Government Printing Office, Washington, D.C., 1980.
11. National Center for Health Statistics: Eighth revision international classification of diseases, adapted for use in the United States. PHS Publication No. 1693. U.S. Government Printing Office, Washington, D.C., 1967.
12. Haupt, B. J.: Detailed diagnoses and surgical procedures for patients discharged from short-stay hospitals: United States, 1978. PHS Publication No. 80-1274. U.S. Government Printing Office, Washington, D.C., 1980.
13. Glickman, L.: Inpatient utilization of short-stay hospitals by diagnosis: United States, 1975. PHS Publication No. 78-1786. Vital Health Stat [13], No. 35, U.S. Government Printing Office, Washington, D.C., 1978.
14. Accreditation Council for Graduate Medical Education: Essentials of accredited residencies. In *Directory of residency training programs—'81/'82*. American Medical Association, Chicago, 1981, pp. 22-39.
15. Health United States 1980 with prevention profile. DHHS Publication No. (PHS) 81-1232. Office of Health Research, Statistics, and Technology, National Center for Health Statistics, National Center for Health Services Research, Hyattsville, Md., October 1980.
16. Meyer, R. J.: Childhood injury and pediatric education: a critique. *Pediatrics* 44: 865-869 (1969).
17. Ebert, R. V.: Training of the internist as a primary physician. *Ann Intern Med* 76: 653-656 (1972).
18. Bass, L. W., and Wilson, T. R.: The pediatrician's influence in private practice by a controlled seat belt study. *Pediatrics* 33: 700-704 (1964).
19. Hanlon, J. J.: Injuries. In *Public health administration and practice*. Ed. 6. C. V. Mosby Co., St. Louis, 1974, pp. 539-543.
20. Maisel, G., Landoc, B. A., Jenkins, M. Q., and Aycock, E. K.: Analysis of two surveys evaluating a project to reduce accidental poisoning among children. *Public Health Rep* 82: 555-560, June 1967.
21. Brann, E. A., et al.: Strategies for the prevention of pregnancy in adolescents. *Adv Plann Parent* 14: 68-76 (1979).
22. Hollingsworth, D. R., and Kessler, A. K. K.: Teenage pregnancy. Solutions are evolving. *N Engl J Med* 303: 516-518, Aug. 28, 1980.
23. Williamson, J. W., *Improving medical practice and health care*. Cambridge, Mass., Ballinger, 1977.